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COE 197S ME 8: Activity 2

MODIFYING AN IMAGE

1-3)

```
C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\1-running_containers>docker run -it ubuntu:16.04 /bin/bash
root@3f666fa322b3:/# ping google.com
bash: ping: command not found
root@3f666fa322b3:/# apt-get update
Get:1 http://archive.ubuntu.com/ubuntu xenial InRelease [247 kB]
Get:2 http://security.ubuntu.com/ubuntu xenial-security InRelease [109 kB]
Get:3 http://security.ubuntu.com/ubuntu xenial-security/main amd64 Packages [2051 kB]
Get:4 http://archive.ubuntu.com/ubuntu xenial-updates InRelease [109 kB]
Get:5 http://archive.ubuntu.com/ubuntu xenial-backports InRelease [107 kB]
Get:6 http://archive.ubuntu.com/ubuntu xenial/main amd64 Packages [1558 kB]
Get:7 http://archive.ubuntu.com/ubuntu xenial/restricted amd64 Packages [14.1 kB]
Get:8 http://archive.ubuntu.com/ubuntu xenial/universe amd64 Packages [9827 kB]
Get:9 http://security.ubuntu.com/ubuntu xenial-security/restricted amd64 Packages [15.9 kB]
Get:10 http://security.ubuntu.com/ubuntu xenial-security/universe amd64 Packages [984 kB]
Get:11 http://security.ubuntu.com/ubuntu xenial-security/multiverse amd64 Packages [8820 B]
Get:12 http://archive.ubuntu.com/ubuntu xenial/multiverse amd64 Packages [176 kB]
Get:13 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 Packages [2559 kB]
Get:14 http://archive.ubuntu.com/ubuntu xenial-updates/restricted amd64 Packages [16.4 kB]
Get:15 http://archive.ubuntu.com/ubuntu xenial-updates/universe amd64 Packages [1544 kB]
Get:16 http://archive.ubuntu.com/ubuntu xenial-updates/multiverse amd64 Packages [26.2 kB]
Get:17 http://archive.ubuntu.com/ubuntu xenial-backports/main amd64 Packages [10.9 kB]
Get:18 http://archive.ubuntu.com/ubuntu xenial-backports/universe amd64 Packages [12.7 kB]
Fetched 19.4 MB in 60s (319 kB/s)
Reading package lists... Done
root@3f666fa322b3:/#
```

4)

```
root@3f666fa322b3:/# apt-get install iputils-ping
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libffi6 libgmp10 libgnutls-openssl27 libgnutls30 libhogweed4 libidn11 libnettle6 libp11-kit0 libtasn1-6
Suggested packages:
  gnutls-bin
The following NEW packages will be installed:
  iputils-ping libffi6 libgmp10 libgnutls-openssl27 libgnutls30 libhogweed4 libidn11 libnettle6 libp11-kit0 libtasn1-6
0 upgraded, 10 newly installed, 0 to remove and 5 not upgraded.
Need to get 1307 kB of archives.
After this operation, 3781 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu xenial/main amd64 libgmp10 amd64 2:6.1.0+dfsg-2 [240 kB]
Get:2 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libnettle6 amd64 3.2-1ubuntu0.16.04.2 [93.7 kB]
Get:3 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libhogweed4 amd64 3.2-1ubuntu0.16.04.2 [136 kB]
Get:4 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libidn11 amd64 1.32-3ubuntu1.2 [46.5 kB]
Get:5 http://archive.ubuntu.com/ubuntu xenial/main amd64 libffi6 amd64 3.2.1-4 [17.8 kB]
Get:6 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libp11-kit0 amd64 0.23.2-5~ubuntu16.04.2 [107 kB]
Get:7 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libtasn1-6 amd64 4.7-3ubuntu0.16.04.3 [43.5 kB]
Get:8 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libgnutls30 amd64 3.4.10-4ubuntu1.8 [548 kB]
Get:9 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libgnutls-openssl27 amd64 3.4.10-4ubuntu1.8 [21.9 kB]
Get:10 http://archive.ubuntu.com/ubuntu xenial/main amd64 iputils-ping amd64 3:20121221-5ubuntu2 [52.7 kB]
Fetched 1307 kB in 5s (244 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package libgmp10:amd64.
(Reading database ... 4785 files and directories currently installed.)
Preparing to unpack .../libgmp10_2%3a6.1.0+dfsg-2_amd64.deb ...
Unpacking libgmp10:amd64 (2:6.1.0+dfsg-2) ...
Selecting previously unselected package libnettle6:amd64.
Preparing to unpack .../libnettle6_3.2-1ubuntu0.16.04.2_amd64.deb ...
Unpacking libnettle6:amd64 (3.2-1ubuntu0.16.04.2) ...
Selecting previously unselected package libhogweed4:amd64.
Preparing to unpack .../libhogweed4_3.2-1ubuntu0.16.04.2_amd64.deb ...
Unpacking libhogweed4:amd64 (3.2-1ubuntu0.16.04.2) ...
Selecting previously unselected package libidn11:amd64.
Preparing to unpack .../libidn11_1.32-3ubuntu1.2_amd64.deb ...
Unpacking libidn11:amd64 (1.32-3ubuntu1.2) ...
Selecting previously unselected package libffi6:amd64.
Preparing to unpack .../libffi6_3.2.1-4_amd64.deb ...
Unpacking libffi6:amd64 (3.2.1-4) ...
Selecting previously unselected package libp11-kit0:amd64.
Preparing to unpack .../libp11-kit0_0.23.2-5~ubuntu16.04.2_amd64.deb ...
Unpacking libp11-kit0:amd64 (0.23.2-5~ubuntu16.04.2) ...
Selecting previously unselected package libtasn1-6:amd64.
Preparing to unpack .../libtasn1-6_4.7-3ubuntu0.16.04.3_amd64.deb ...
Unpacking libtasn1-6:amd64 (4.7-3ubuntu0.16.04.3) ...
Selecting previously unselected package libgnutls30:amd64.
Preparing to unpack .../libgnutls30_3.4.10-4ubuntu1.8_amd64.deb ...
Unpacking libgnutls30:amd64 (3.4.10-4ubuntu1.8) ...
Selecting previously unselected package libgnutls-openssl27:amd64.
Preparing to unpack .../libgnutls-openssl27_3.4.10-4ubuntu1.8_amd64.deb ...
Unpacking libgnutls-openssl27:amd64 (3.4.10-4ubuntu1.8) ...
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Selecting previously unselected package libgnutls-openssl27:amd64.
Preparing to unpack .../libgnutls-openssl27_3.4.10-4ubuntu1.8_amd64.deb ...
Unpacking libgnutls-openssl27:amd64 (3.4.10-4ubuntu1.8) ...
Selecting previously unselected package iputils-ping.
Preparing to unpack .../iputils-ping_3%3a20121221-5ubuntu2_amd64.deb ...
Unpacking iputils-ping (3:20121221-5ubuntu2) ...
Processing triggers for libc-bin (2.23-0ubuntu11.2) ...
Setting up libgmp10:amd64 (2:6.1.0+dfsg-2) ...
Setting up libnettle6:amd64 (3.2-1ubuntu0.16.04.2) ...
Setting up libhogweed4:amd64 (3.2-1ubuntu0.16.04.2) ...
Setting up libidn11:amd64 (1.32-3ubuntu1.2) ...
Setting up libffi6:amd64 (3.2.1-4) ...
Setting up libp11-kit0:amd64 (0.23.2-5~ubuntu16.04.2) ...
Setting up libtasn1-6:amd64 (4.7-3ubuntu0.16.04.3) ...
Setting up libgnutls30:amd64 (3.4.10-4ubuntu1.8) ...
Setting up libgnutls-openssl27:amd64 (3.4.10-4ubuntu1.8) ...
Setting up iputils-ping (3:20121221-5ubuntu2) ...
Setcap is not installed, falling back to setuid
Processing triggers for libc-bin (2.23-0ubuntu11.2) ...
root@3f666fa322b3:/#

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5)

```

root@3f666fa322b3:/# ping google.com
PING google.com (142.250.204.110) 56(84) bytes of data.
64 bytes from 142.250.204.110: icmp_seq=1 ttl=37 time=76.7 ms
64 bytes from 142.250.204.110: icmp_seq=2 ttl=37 time=34.2 ms
64 bytes from 142.250.204.110: icmp_seq=3 ttl=37 time=41.5 ms
64 bytes from 142.250.204.110: icmp_seq=4 ttl=37 time=29.5 ms
64 bytes from 142.250.204.110: icmp_seq=5 ttl=37 time=34.1 ms
64 bytes from 142.250.204.110: icmp_seq=6 ttl=37 time=30.4 ms
64 bytes from 142.250.204.110: icmp_seq=7 ttl=37 time=32.4 ms
^C
--- google.com ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6010ms
rtt min/avg/max/mdev = 29.595/39.876/76.766/15.487 ms
root@3f666fa322b3:/# exit
exit

C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\1-running_containers>

```

COMMITTING CHANGES

1-3)

```
C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\1-running_containers>docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED          STATUS          PORTS          NAMES
3f666fa322b3   ubuntu:16.04   "/bin/bash"             8 minutes ago    Exited (0)      About a minute ago    cool_pascal
```

```
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\1-running_containers> docker commit -a 'Enzo Alcantara' -m 'Added ping utility.' 3f6 ealcantara/ping
sha256:fbcb4b262ff8d9d9d90504e2f8c31e0aed2a65eb227d9ffab9cafea22fff
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\1-running_containers> docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
ealcantara/ping latest    fbc7b4b262ff  21 seconds ago 170MB
ubuntu        16.04    9ff95a467e45  15 hours ago  135MB
docker101tutorial latest    7b5ba9c64d1c  15 hours ago  28MB
alpine/git     latest    2abeafdf5b9   3 days ago    25.1MB
docker/getting-started latest    3ba8f2ff0727  2 months ago  27.9MB
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\1-running_containers>
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\1-running_containers> docker run -it --rm ealcantara/ping /bin/bash
root@447dafb6817d:/# ping google.com
PING google.com (142.250.204.110) 56(84) bytes of data:
64 bytes from 142.250.204.110: icmp_seq=1 ttl=37 time=26.4 ms
64 bytes from 142.250.204.110: icmp_seq=2 ttl=37 time=32.8 ms
64 bytes from 142.250.204.110: icmp_seq=3 ttl=37 time=33.6 ms
64 bytes from 142.250.204.110: icmp_seq=4 ttl=37 time=32.8 ms
64 bytes from 142.250.204.110: icmp_seq=5 ttl=37 time=34.1 ms
^C
--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 26.482/31.981/34.143/2.799 ms
root@447dafb6817d:/# exit
exit
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\1-running_containers>
```

BUILDING THE DOCKERFILE

```
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\3-building_images> docker build -t 'delner/ping' .
[+] Building 105.4s (7/7) FINISHED
=> [internal] load build definition from Dockerfile                                1.9s
=> => transferring Dockerfile: 142B                                              0.5s
=> [internal] load .dockerignore                                                  1.5s
=> => transferring context: 2B                                                  0.4s
=> [internal] load metadata for docker.io/library/ubuntu:16.04                 0.0s
=> [1/3] FROM docker.io/library/ubuntu:16.04                                   4.5s
=> [2/3] RUN apt-get update                                                     63.0s
=> [3/3] RUN apt-get install -y iputils-ping                                   32.1s
=> exporting to image                                                            1.4s
=> => exporting layers                                                            1.0s
=> => writing image sha256:c02c456891b0e5b914405a7b7e025110c31603ea7b00ea009fc1d374067a050 0.1s
=> => naming to docker.io/delner/ping                                           0.1s

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\3-building_images> docker build -t 'delner/ping' .
[+] Building 2.2s (7/7) FINISHED
=> [internal] load build definition from Dockerfile                                0.0s
=> => transferring Dockerfile: 11B                                              0.0s
=> [internal] load .dockerignore                                                  1.1s
=> => transferring context: 2B                                                  0.0s
=> [internal] load metadata for docker.io/library/ubuntu:16.04                 0.0s
=> [1/3] FROM docker.io/library/ubuntu:16.04                                   0.0s
=> CACHED [2/3] RUN apt-get update                                               0.0s
=> CACHED [3/3] RUN apt-get install -y iputils-ping                            0.0s
=> exporting to image                                                            0.1s
=> => exporting layers                                                            0.0s
=> => writing image sha256:c02c456891b0e5b914405a7b7e025110c31603ea7b00ea009fc1d374067a050 0.1s
=> => naming to docker.io/delner/ping                                           0.0s

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\3-building_images> docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
delner/ping   latest    c02c456891b0  58 seconds ago 170MB
ubuntu        16.04    9ff95a467e45  15 hours ago  135MB
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\3-building_images>
```

OPTIMIZING THE DOCKERFILE

```
Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\3-building_images> docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
delner/ping    latest    c02c456891b0   58 seconds ago 170MB
ubuntu        16.04     9ff95a467e45   15 hours ago   135MB
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\3-building_images> docker build -t 'delner/ping' .
[+] Building 98.6s (6/6) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring Dockerfile: 10.0B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/ubuntu:16.04
=> CACHED [1/2] FROM docker.io/library/ubuntu:16.04
=> [1/2] RUN apt-get update && apt-get install -y iputils-ping && apt-get clean && cd /var/lib/apt/lists && rm -fr *Release
=> exporting to image
=> => exporting layers
=> => writing image sha256:53680a3fbe0979b7b79637d3b17c28a3d7945568edc4a783dea3bcb8a6c342e0
=> => naming to docker.io/delner/ping

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\3-building_images> docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
delner/ping    latest    53680a3fbe09   26 seconds ago 139MB
<none>         <none>    c02c456891b0   5 minutes ago 170MB
ubuntu        16.04     9ff95a467e45   15 hours ago   135MB
PS C:\Users\Enzo Alcantara\Documents\GitHub\ME8_Containerization_and_Docker\3-building_images>
```

OTHER DOCKERFILE DIRECTIVES

```
PS C:\WINDOWS\system32>
PS C:\WINDOWS\system32> docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
delner/ping    latest    01df3466cd4a   About a minute ago 139MB
<none>         <none>    53680a3fbe09   4 minutes ago   139MB
<none>         <none>    c02c456891b0   10 minutes ago  170MB
ubuntu        16.04     9ff95a467e45   15 hours ago    135MB
PS C:\WINDOWS\system32> docker run -it delner/ping
PING google.com (142.250.204.110) 56(84) bytes of data.
64 bytes from 142.250.204.110: icmp_seq=1 ttl=37 time=29.1 ms
64 bytes from 142.250.204.110: icmp_seq=2 ttl=37 time=30.9 ms
64 bytes from 142.250.204.110: icmp_seq=3 ttl=37 time=33.0 ms
64 bytes from 142.250.204.110: icmp_seq=4 ttl=37 time=32.0 ms
^C
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3003ms
rtt min/avg/max/mdev = 29.184/31.310/33.031/1.437 ms
PS C:\WINDOWS\system32>
```